T-Helper I: An Electronic Medical Record Supporting the Treatment of AIDS

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THERAPY-HELPER (T-HELPER) is an electronic medical-record system developed at Stanford University that is installed at an AIDS clinic in San Jose, California. The system has been developed using an open, distributed architecture. The T-HELPER workstation supports access by physicians and nurses to online progress notes and hypertext descriptions of ongoing clinical trials. Laboratory and patient-registration data are downloaded automatically from existing hospital information systems. Physicians enter detailed clinical data directly into T-HELPER using a menu-based progress-note system known as IVORY.

To create effective decision-support systems, developers must embed those systems within a clinical information infrastructure that can supply rich descriptions of patients' conditions over time. We are building such a decision support system in two phases to meet these requirements: T-HELPER I will provide the information-systems support, and T-HELPER II will provide decision support for AIDS clinical trials.

T-HELPER I recently was installed at Santa Clara Valley Medical Center in San Jose, California [1]. T-HELPER I provides a patient-record system that can communicate with other information systems at our field site. Laboratory and registration data, as well as nursing notes are available for review, and practitioners can compose comprehensive progress notes. Summaries of all of the clinical protocols available in the clinic can be perused contemporaneously.

The subjective and objective portions of the progress note are created by a subsystem known as IVORY [2]. IVORY contains a controlled vocabulary derived initially from the WARP language, which we have modified extensively for the care of patients who have AIDS. The vocabulary drives the creation of menus that allow users of T-HELPER to compose complete progress notes by making a succession of mouse clicks. The particular findings that appear in the menus are determined dynamically from the patient's clinical problems as entered into T-HELPER. As a user makes selections from the IVORY menus, the system automatically generates English sentences that appear within a textual progress note that can be added to the patient's paper-based medical record.

T-HELPER ultimately will provide active decision support to health-care workers caring for patients with HIV infection. The system will inform clinicians when patients are eligible (or potentially eligible) for enrollment in clinical trials [3], and also will assure that patients who are enrolled in clinical-trial protocols are offered therapy that is consistent with protocol guidelines. In a controlled experiment, we will first evaluate the effect of the T-HELPER I patient-record system on physician compliance with protocol guidelines and on the rate of patient accrual to new clinical trials; we then will add active decision-support features in the T-HELPER II workstation, allowing us to measure the marginal benefit provided by these additional knowledge-based elements [1].

The system runs on UNIX workstations. The graphical user interface is written in X-Windows and OSF/Motif, allowing a distributed, client–server architecture. Patient data are stored in a relational database and accessed via SQL. Network communication is via the TCP/IP protocol. Although the construction of T-HELPER has been complicated by the continuing evolution of the X-Windows system, our design has resulted in an interactive patient-record system that can be readily transported to hardware platforms provided by a variety of vendors.

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